

Java Basics



Table of contents:

Introduction to the Course

- Introduction
- What is Programming?
- The Tools You Need

Setting Up

- Installing the JDK on Windows
- Setting Up Environment Variables on Windows
- Installing IntelliJ IDEA on Windows
- Installing the JDK on Mac
- Setting Up Environment Variables on Mac
- Installing IntelliJ IDEA on Mac

First Steps

- Creating a New Project
- Creating and Loading a Template Project
- Welcome to Your Challenge!
- Challenge Part 1 - Exercise
- Challenge Part 1 - Solution

Variables

- What are Variables?
- INT
- Doubles
- Booleans
- Strings
- Primitive Versus Class Types
- Conclusion
- Challenge Part 2 - Exercise

Expressions

- Numeric Expressions
- Boolean Expressions
- Simplifying Boolean Expressions
- Logical Operators

Strings

- String Concatenation
- String Operations
- Transforming Strings
- Boolean-Based String Checks

- Int-Based String Checks
- Creating New Strings

Conditionals

- Logical Operators Recap
- The If Block
- The Else Block
- Alternate Flows with Elseif
- Thinking About Conditionals
- Dead Branches
- Refactoring to Simplify Conditionals
- Nested Conditionals
- Good Versus Bad Refactoring
- The Switch Statement
- Break Statements in Switches
- The Ternary Operator

Loops

- What are Loops?
- The While Loop
- The Do While Loop
- The For Loop
- Esoteric Loops
- The For Each Loop with Collections
- Processing Collections with Streams

Methods

- What are Methods?
- Creating a Method
- Calling a Method
- Passing Parameters
- Passing Multiple Parameters
- Returning Output from a Method
- Using a Returned Value
- Refactoring: Inlining
- Refactoring: Removing Unnecessary Variables

Classes and Objects

- What are Objects?
- Creating a Class
- Visibility Modifiers
- Constructors
- The Default Constructor
- Instances and State
- Adding Methods to Classes
- Getters and Setters
- Why Encapsulation is Important
- Protecting the Integrity of Your Objects

- Composing Objects
- Referencing Other Objects
- Object References
- Stepping into an Object's Methods
- Concept of Inheritance
- Extending a Class
- Adding Custom Methods
- Creating Another Subclass
- Viewing the Type Hierarchy
- Superclass Variable References
- Concept of Polymorphism
- Abstract Methods
- Non-Instantiability of Abstract Classes
- Implementing Abstract Methods
- Custom Implementation of Superclass Methods
- Polymorphism in Action
- Recap of OO Concepts

Exceptions

- Concept of an Exception
- Try Catch Blocks
- Scoping in Try Blocks
- Happy Path and Error Path
- Throwing Exceptions
- Creating and Throwing Your Own Exceptions
- Chaining Exceptions
- Checked Exceptions
- Non-Checked Exceptions
- Differences Between Checked and Non-Checked Exceptions
- Bubbling Exceptions Up the Call Stack
- Runtime Exception Handling in Nested Method Calls
- Checked Exception Handling in Nested Method Calls
- Exceptions and Non-Void Methods
- Multiple Catch Blocks
- Alternate Exceptions in a Catch Block
- Ordering of Catch Blocks

Collections

- Lists
- The Collection Interface
- Sets
- Lists Versus Sets
- Maps
- Coding with Classes and Collections
- Using Your Own Classes with Collections
- The Equals Method with Collections
- Implementing Hash Code and Equals